

Microhabitat preferences of *Veigaia mollis* Karg, 1971 in the mountain reserve ‘Szczeliniec Wielki’

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Abstract: During this study, 289 specimens of *Veigaia mollis* were found in the mountain reserve ‘Szczeliniec Wielki’ (Sudetes, SW Poland). Density of this species varied from 21 to 646 ind./m². In all tested plots, its density increased in August in cowberry microhabitats.

Key words: *Veigaia mollis*, Mesostigmata, microhabitat, Szczeliniec Wielki

INTRODUCTION

KARG (1971) first reported *Veigaia mollis* in Poland from pine and deciduous forests in mountains, where it occurred on stones covered by moss. It has also been recorded in beech forest with maple and spruce, and in spruce forests with larch (SKORUPSKI & GOŁOJUCH 1996). Moreover, SKORUPSKI and ŁABĘDZKI (2004) found *Veigaia mollis* in the forest-steppe reserve in Bielinek on the lower Odra river (‘Bielinek nad Odrą’), in the soil and in xerothermic sites.

This acarological study conducted in the reserve ‘Szczeliniec Wielki’ was only qualitative and its main goal was to recognize the species diversity of mites. This study is the first attempt to describe quantitatively the microhabitat preferences of *Veigaia mollis* in various forest groups in the reserve ‘Szczeliniec Wielki’.

STUDY AREA

The study area was the flattened top of Szczeliniec Wielki (altitude ca. 900 m), which is protected as a nature reserve within the Stołowe Mts. National Park (Sudetes, SW Poland). The reserve is covered by forest groups dominated by Scots pine (*Pinus sylvestris*), Norway spruce (*Picea abies*), or silver birch (*Betula pendula*) and characterized by specific climatic conditions. The mean annual precipitation in 1979-96 was 654 mm (weather station of the Institute of Meteorology and Water

Management in Kudowa Zdrój), but differences between years reached up to 400 mm (NOWICKA 1998).

MATERIAL AND METHODS

Research was conducted from June to August 2004 in 9 plots established in forest groups dominated by Scots pine, Norway spruce, or silver birch (3 plots in forest groups of each type). Three types of microhabitats – cowberry (*Vaccinium vitis-idaea*), bilberry (*Vaccinium myrtillus*), and bryophytes – occurred in each plot (see Table 1). From all plots, 36 samples (4 per plot) were collected every month from bilberry and cowberry microhabitats, however from 7 plots 28 samples (4 per plots) were collected from bryophytes microhabitats (in total 300 samples). The samples were gathered with a sampler (area 40 cm², depth 10 cm). Research material consisted of organic material accumulated on sandstone. Mites were extracted by using Tullgren funnels and preserved in 75% alcohol. For maceration and microscopic examination of the specimens, mites were selected and prepared in lactophenol.

Table. 1. Density (ind./m²) of *Veigaia mollis* in investigated forest groups and their microhabitats in June, July and August 2004

Month	Density (ind./m ²) of <i>Veigaia mollis</i> in forest stands dominated by									Total density (ind./m ²) of mesostigmatic mites
	<i>Pinus sylvestris</i> (pine)			<i>Picea abies</i> (spruce)			<i>Betula pendula</i> (birch)			
	V.m.	V.vi	Bry.	V.m.	V.vi	Bry.	V.m.	V.vi	Bry.	
June	312	62	0	271	21	292	292	125	583	4632
July	208	104	0	229	21	146	62	42	646	2107
August	187	417	21	333	146	104	417	646	333	3078
Mean	236	194	7	260	63	181	257	271	521	3272

V.m. – *Vaccinium myrtillus* (bilberry); V.vi. – *Vaccinium vitis-idaea* (cowberry); Bry. – bryophytes

RESULTS

As a result of the investigations, 289 specimens of *Veigaia mollis* were found. Not all developmental stages were present. Deutonymphs (64%) were more numerous than protonymphs (26%). Because of the low average number of individuals of this species per sample, results were calculated per 1 m² of the investigated area (Table 1). The density of *Veigaia mollis* varied from 21 to 646 ind./m². The highest density occurred in birch stands: in July in bryophytes and in August in cowberry microhabitats. A very low density of mites (21 ind./m²) was recorded in June and July within spruce groups in cowberry microhabitats and in August in bryophytes in pine stands. No mites of this species were found in bryophytes from pine stands in June and July.

Densities of *Veigaia mollis* increased in August in all plots (spruce, pine, and birch groups) in the cowberry microhabitats. In June the density of *Veigaia mollis* in cowberry microhabitats was similar (ca. 300 specimens per 1 m²) in all 3 examined types of forest groups.

DISCUSSION

Mite density in forest groups (per 1 m²) depends on type of forest and, connected with that, type of humus. In the humid forests with mor humus, from 0.1 million to almost 0.5 million of those arthropods are found per 1 m². In other types of forest, numbers of those animals on the same area vary from several thousand to over 0.1 million (BOCZEK & BŁASZAK 2005). In the conducted research the highest total density of mesostigmatic mites was 4632 ind./m² and *Veigaia mollis* reached 646 ind./m². According to BEDANO et al. (2005), differences in mite density can be due to the amount of organic material, soil humidity during the year, soil temperature (e.g. high amplitudes during the summer), and also to soil pH (close to neutral is optimal for astigmatid and mesostigmatid mites). Initial measurements of soil acidity did not show any significant differences between the studied forest groups and their microhabitats, and it ranged between 3.58–4.1 pH. However, it must be remembered that the response of a species to soil pH can change with changing environmental factors (BEDANO et al. 2005).

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